IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Xiaofang Lin et al.   **Confirmation No.:**   8162

Serial No.: 10/769,240   **Examiner:** Zenati, Amal S.

Filed: January 30, 2004   **Group Art Unit:**   2614

Title: SYSTEM AND METHOD FOR LANGUAGE VARIATION GUIDED OPERATOR SELECTION

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
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APPEAL BRIEF - PATENTS

Madam:

This is an Appeal Brief in connection with the decisions of the Examiner in a Final Office Action dated July 30, 2008. It is respectfully submitted that the present application has been twice rejected. Each of the topics required in an Appeal Brief and a Table of Contents are presented herewith and labeled appropriately.

TABLE OF CONTENTS

(1)   Real Party In Interest

The real party in interest is Hewlett-Packard Development Company, L.P.

(2)   Related Appeals And Interferences

There are no other appeals or interferences related to this case.

(3)   Status Of Claims

Claims 1-24 are pending in the present application.

Claims 1-24 stand rejected.

The rejection of claims 1-24 is appealed.

(4)   Status of Amendments

No amendment has been filed subsequent to the Final Office Action dated July 30, 2008.

(5)   Summary Of Claimed Subject Matter

Claim 1 provides for a method for operator selection, comprising:

initiating a dialog between a contact and a call handling system (page 3, line 4; page 14, lines 21-22; figure 2);

identifying a language variation spoken by the contact (page 3, lines 4-5; page 14, lines 22-23; figure 2);

determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator (page 3, lines 5-6; page 11, lines 5-8; page 14, lines 23-25; figure 2);

selecting an operator whose skill level in the language variation is above a predetermined value (page 3, lines 6-7; page 14, lines 25-26; figure 2); and

transferring the dialog with the contact to the operator (page 3, line 8; page 14, line 26 – page 15, line 1; figure 2).

Claim 21 provides for a method for operator selection, comprising:

initiating a dialog between a contact and a call handling system (figure 3A; page 15, lines 5-6);

generating a set of confidence scores indicating a likelihood that the contact speaks each language variation within a set of language variations (figure 3A; page 15, lines 11-13);

generating an inverse distance weighted confidence score for each of the language variations using the confidence score and an inversely weighted distance between the contact and each language variation (figure 3A; page 15, lines 13-15);

associating a language variation with the contact if that language variation's inverse distance weighted confidence score is above a predetermined value (figure 3A; page 15, lines 15-19);

determining a skill level with respect to the language variation associated with the contact for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator (figure 3A-3B; page 11, lines 5-8; page 15, lines 20 – page 16, line 2);

selecting an operator whose skill level in the language variation associated with the contact is above a predetermined value (figure 3B; page 16, lines 3-10); and

transferring the dialog with the contact to the operator (figure 3B; page 16, lines 10-13).

Claim 22 provides for a computer-usable medium embodying computer program code for performing operator selection, comprising:

initiating a dialog between a contact and a call handling system (page 3, line 4; page 14, lines 21-22; figures 1 and 2);

identifying a language variation spoken by the contact (page 3, lines 4-5; page 14, lines 22-23; figures 1 and 2);

determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator (page 3, lines 5-6; page 11, lines 5-8; page 14, lines 23-25; figures 1 and 2);

selecting an operator whose skill level in the language variation is above a predetermined value (page 3, lines 6-7; page 14, lines 25-26; figure 2); and

transferring the dialog with the contact to the operator (page 3, line 8; page 14, line 26 – page 15, line 1; figures 1 and 2).

Claim 24 provides for a system for operator selection comprising a:

means for initiating a dialog between a contact and a call handling system (page 3, line 4; page 14, lines 21-22; figures 1 and 2);

means for identifying a language variation spoken by the contact (page 3, lines 4-5; page 14, lines 22-23; figures 1 and 2);

means for determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator (page 3, lines 5-6; page 11, lines 5-8; page 14, lines 23-25; figures 1 and 2);

means for selecting an operator whose skill level in the language variation is above a predetermined value (page 3, lines 6-7; page 14, lines 25-26; figures 1 and 2); and

means for transferring the dialog with the contact to the operator (page 3, line 8; page 14, line 26 – page 15, line 1; figures 1 and 2).

(6)   Grounds of Rejection to be Reviewed on Appeal

a) Whether claims 1-15, 22 and 24 are unpatentable under 35 U.S.C. §103(a) over Das et al (US Patent No. 6,847,714) in view of Bala (US Patent No. 6,798,876).

b) Whether claims 16-21 and 23 are unpatentable under 35 U.S.C. §103(a) over Das et al. (US Patent No. 6,847,714), Bala (US Patent No. 6,798,876) and one or more of Bahler et al. (US Patent No. 4,896,358), Mitsa (Image Registration Using Elastic Contours And Internal Landmarks, IEEE Instrumentation and Measurement Technology Conference St. Paul, Minnesota, USA 18-20, 1998) and Gupta (US Patent No. 6,122,361).

(7)   Arguments

I   **Rejection of claims 1-15, 22 and 24 under 35 U.S.C. §103(a) over Das et al. (US Patent No. 6,847,714) in view of Bala (US Patent No. 6,798,876)**

The Examiner has rejected claims 1-15, 22 and 24 as being unpatentable over Das et al., US Patent No. 6,847,714 (hereinafter referred to as "Das") in view of Bala, US Patent No. 6,798,876 (hereinafter referred to as "Bala"). Appellants respectfully traverse the rejection of claims 1-15, 22 and 24.

The Applicable Law

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in KSR International Co. v. Teleflex Inc., 550 U.S._, 82 USPQ2d 1385 (2007):

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Quoting Graham v. John Deere Co. of Kansas City, 383 U.S. 1 (1966).

As set forth in MPEP 2143.03, to ascertain the differences between the prior art and the claims at issue, "[a]ll claim limitations must be considered" because "all words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385. According to the Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of KSR International Co. v. Teleflex Inc., Federal Register, Vol. 72, No. 195, 57526, 57529 (October 10, 2007), once the Graham factual inquiries are resolved, there must be a determination of whether the claimed invention would have been obvious to one of ordinary skill in the art based on any one of the following proper rationales:

> (A) Combining prior art elements according to known methods to yield predictable results; (B) Simple substitution of one known element for another to obtain predictable results; (C) Use of known technique to improve similar devices (methods, or products) in the same way; (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (E) "Obvious to try"— choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a

different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. KSR International Co. v. Teleflex Inc., 550 U.S._, 82 USPQ2d 1385 (2007).

Furthermore, as set forth in KSR International Co. v. Teleflex Inc., quoting from In re Kahn, 441 F.3d 977, 988 (CA Fed. 2006), "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasonings with some rational underpinning to support the legal conclusion of obviousness."

Therefore, if the above-identified criteria and rationales are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s).

The Das Reference

Das generally discloses matching a communicant with a call-center agent. Upon the connection of a communicant with the call center, a voice sample of the communicant is collected. The voice sample is analyzed to determine communicant attributes, such as for example, the language, the accent, and the degree of the accent. A call distribution algorithm is used to compare the communicant attributes against agent skill attributes to select the agent that is best qualified to handle the call with the communicant.

The Bala Reference

Bala generally discloses a system for routing a call received from a caller to the most appropriate service representative. The call center maintains caller profiles and service representative profiles. Upon the receipt of a call from a caller, the call center retrieves the caller profile and compares the caller profile against the service

representative profiles to identify the service representative best equipped to handle the call from the caller. The system monitors the call data to determine whether the call was successful and updates the customer profile and the customer service representative profile following completion of the call.

Rejection of claims 1-15, 22 and 24 under 35 U.S.C. §103(a) over Das in view of Bala

Independent claims 1, 22, and 24 recite a method, a computer usable medium embodying a computer program, and a system, respectively, for performing operator selection. A dialog is initiated between a contact and a call handling system and a language variation spoken by the contact is identified. A skill level is determined with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system. *The skill level for each operator within the set of operators is determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator.* An operator is selected whose skill level in the language variation is above a predetermined value and the dialog with the contact is transferred to the operator.

Das discloses matching a communicant with a call-center agent. Upon the connection of a communicant with the call center, a voice sample of the communicant is collected. The voice sample is analyzed to determine communicant attributes, such as for example, the language, the accent, and the degree of the accent. A call distribution algorithm is used to compare the communicant attributes against agent skill attributes to select the agent that is best qualified to handle the call with the communicant.

However, as Examiner has stated in the Final Action, Das does not teach *determining the skill level for each operator within the set of operators on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator* as recited by claims 1, 22 and 24.

Appellants respectfully submit that the above-stated deficiencies of the disclosure of Das with respect to the claims 1, 22 and 24 are not cured by the disclosure of Bala. Examiner incorrectly represents in the Final Action that column 6, lines 15-18 of Bala discloses that the skill level for each operator within the set of operators is determined *on a real time basis* while each operator is engaged in a dialog with a contact that has been transferred to that operator as recited by claims 1, 22 and 24. Column 6, lines 15-18 of the Bala disclosure specifically states "automatically updating, *at the completion of the call*, the caller profile and the highest ranked customer service profile with information regarding the success of the call." In other words, while the Bala system monitors call data during the actual call, the Bala system does not actually update the customer service representative profile until *after the completion of the call*. Claims 1, 22 and 24, on the other hand, recite making a determination of a skill level for each operator within a set of operators on *a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator*.

Since neither Das nor Bala, either alone or in combination, disclose each of the elements recited by claims 1, 22 and 24, Appellants respectfully request that the rejection of claims 1, 22, and 24 as being unpatentable over Das in view of Bala be withdrawn.

Dependent claims 2-15, which further define patentably distinct independent claim 1, are also believed to be allowable over the cited references. Accordingly, Appellants respectfully request that the rejection of dependent claims 2-15 under 35 U.S.C. § 103(a) be withdrawn.

II   **Rejection of claims 16-21 and 23 under 35 U.S.C. §103(a) over Das, Bala and one or more of Bahler et al., US Patent No. 4,896,358 (hereinafter referred to as "Bahler"), Mitsa, Image Registration Using Elastic Contours And Internal Landmarks, IEEE Instrumentation and Measurement Technology**

Conference St. Paul, Minnesota, USA 18-20, 1998 (hereinafter referred to as "Mitsa") and Gupta, US Patent No. 6,122,361 (hereinafter referred to as "Gupta").

The Applicable Law

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in KSR International Co. v. Teleflex Inc., 550 U.S._, 82 USPQ2d 1385 (2007):

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> (A) Combining prior art elements according to known methods to yield predictable results; (B) Simple substitution of one known element for another to obtain predictable results; (C) Use of known technique to improve similar devices (methods, or products) in the same way; (D) Applying a known technique to a known device (method, or product) ready

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for improvement to yield predictable results; (E) "Obvious to try"—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. KSR International Co. v. Teleflex Inc., 550 U.S._, 82 USPQ2d 1385 (2007).

Furthermore, as set forth in KSR International Co. v. Teleflex Inc., quoting from In re Kahn, 441 F.3d 977, 988 (CA Fed. 2006), "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasonings with some rational underpinning to support the legal conclusion of obviousness."

Therefore, if the above-identified criteria and rationales are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s).

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The Bahler Reference

Bahler generally discloses an automatic speech recognition system for determining whether a received speech pattern includes a valid phrase or keyword as opposed to an undesirable utterance.

The Mitsa Reference

Mitsa generally discloses the calculation details for determining the value of inverse distance weighted confidence scores.

The Gupta Reference

Gupta generally discloses an automated directory assistance system that combines an acoustical match search with a probabilistic bias. The probabilistic bias is derived from statistical information on the calling patterns of the population. A caller requests a telephone number of a subscriber via a spoken utterance. A speech recognition dictionary includes a plurality of orthographies. Each orthography corresponds to a locality name of a possible residence of the subscriber. The system performs a pass on the basis of the acoustic characteristics of the orthographies in the

speech recognition dictionary. The orthographies are then weighted based on the geographic location of the caller.

Rejection of claims 16-21 and 23 under 35 U.S.C. §103(a) over Das, Bala and one or more of Bahler, Mitsa and Gupta.

Claims 16-20 depend from independent claim 1 and therefore include the elements recited by independent claim 1 including, _inter alia,_ determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system. _The skill level for each operator within the set of operators is determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator._

Independent claim 21 recites a method for operator selection. A dialog is initiated between a contact and a call handling system. A set of confidence scores are generated where the confidence scores indicate a likelihood that the contact speaks each language variation within a set of language variations. An inverse distance weighted confidence score is generated for each of the language variations using the confidence score and an inversely weighted distance is generated between the contact and each language variation. A language variation is associated with the contact if that language variation's inverse distance weighted confidence score is above a predetermined value. A skill level is determined with respect to the language variation associated with the contact for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system. _The skill level for each operator within the set of operators is determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator._ An operator is selected whose skill level in the language variation associated with the contact is above a predetermined value and the dialog with the contact is transferred to the operator.

Claim 23 depends from independent claim 22 and therefore includes the elements recited by independent claim 22 including, *inter alia,* determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system. *The skill level for each operator within the set of operators is determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator.*

Examiner has pointed out in the Final Action, that Das does not teach *determining the skill level for each operator within the set of operators on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator* as recited by the claims at issue.

Examiner incorrectly represents in the Final Action that column 6, lines 15-18 of Bala discloses that the skill level for each operator within the set of operators is determined *on a real time basis* while each operator is engaged in a dialog with a contact that has been transferred to that operator as recited by the claims at issue. Column 6, lines 15-18 of the Bala disclosure specifically states "automatically updating, *at the completion of the call,* the caller profile and the highest ranked customer service profile with information regarding the success of the call." In other words, while the Bala system monitors call data during the actual call, the Bala system does not actually update the customer service representative profile until *after the completion of the call.* On the other hand, claims 16-21 and 23 recite making a determination of a skill level for each operator within a set of operators on *a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator.*

Appellants respectfully submit that the above-stated deficiencies of the disclosures of Das and Bala with respect to the claims at issue are not cured by the disclosures of Bahler, Mitsa and/or Gupta.

Since the cited references, either alone or in combination, fail to disclose each of the elements recited by the claims at issue, Appellants respectfully request that the

rejection of claims 16-21 and 23 as being unpatentable over Das in view of Bala and further in view of one or more of Bahler, Mitsa and Gupta be withdrawn.

(8)   Conclusion

For at least the reasons given above, the rejection of claims 1-24 as being unpatentable is improper. Accordingly, it is respectfully requested that such rejections by the Examiner be reversed and these claims be allowed. Attached below for the Board's convenience is an Appendix of claims 1-24, as currently pending.

Respectfully submitted,

Dated: December 1, 2008   By _____

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(9)   Claim Appendix

1.   A method for operator selection, comprising:

initiating a dialog between a contact and a call handling system;

identifying a language variation spoken by the contact;

determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator;

selecting an operator whose skill level in the language variation is above a predetermined value; and

transferring the dialog with the contact to the operator.

2.   The method of claim 1, wherein determining includes:

receiving a self rating from an operator regarding how difficult a dialog was with a contact who speaks the language variation; and

updating the skill level of the operator using the self rating.

3.   The method of claim 1, wherein determining includes:

defining a set of dialog key words indicating communication difficulties;

rating an operator based on how many of the key words the operator spoke in a dialog with a contact that speaks the language variation; and

updating the skill level of the operator using the rating.

4.   The method of claim 1, wherein determining includes:

measuring a time an operator spent engaged in a dialog with a contact who speaks the language variation;

counting the number of words spoken during the dialog with the contact who speaks the language variation;

rating the operator based on the time spent and number of words spoken;

and

updating the skill level of the operator using the rating.

5.   The method of claim 1, wherein selecting includes:

selecting an operator with a highest skill level in the language variation.

6.   The method of claim 1, wherein selecting includes:

queuing the contact with a soon to be available operator with a highest

skill level in the language variation.

7.   The method of claim 1, wherein selecting includes:

selecting an operator whose second language is equal to the language

variation of the contact.

8.   The method of claim 1, wherein selecting includes:

selecting an operator whose cultural background is associated with the

language variation of the contact.

9.   The method of claim 1, further comprising:

generating a report on all language variations spoken by contacts calling

the call handling system.

10.   The method of claim 1, further comprising:

generating a report on operator skill levels with respect to a predefined set

of language variations.

11.   The method of claim 1, further comprising:

generating a report on disparities between a number of contacts calling

the call handling system and speaking a particular language variation and operators

skilled in the particular language variation.

12.   The method of claim 1, wherein initiating includes:

initiating a dialog between the contact and an interactive voice response

interface.

13.   The method of claim 1, wherein the language variation is an accent

variation.

14.   The method of claim 1, wherein the language variation is a dialect

variation.

15.   The method of claim 1, wherein identifying includes:

retrieving the contact's language variation from a contact database.

16.   The method of claim 1, wherein identifying includes:

generating a set of confidence scores indicating a likelihood that the

contact speaks each language variation within a set of language variations;

generating an inverse distance weighted confidence score for each of the

language variations using the confidence score and an inversely weighted distance

between the contact and each language variation; and

associating a language variation with the contact if that language

variation's inverse distance weighted confidence score is above a predetermined value.

17.   The method of claim 16, wherein generating an inverse distance weighted

confidence score includes:

selecting a first language as a first origin;

calculating the distance between the first origin and each other language

variation;

normalizing these distances with respect to the first origin;

multiplying each normalized distance by its respective confidence score to

generate a set of multiplied results;

totaling the multiplied results to yield an inverse-distance weighted confidence score for the first language variation;

selecting a second language variation as a second origin; and

repeating the selecting, calculating, normalizing, multiplying, and totaling for the second origin.

18.   The method of claim 16 wherein associating includes:

associating a language variation having a highest variation's inverse distance weighted confidence score with the contact.

19.   The method of claim 16, wherein the distance is a physical distance.

20.   The method of claim 16, wherein the distance is a virtual distance.

21.   A method for operator selection comprising:

initiating a dialog between a contact and a call handling system;

generating a set of confidence scores indicating a likelihood that the contact speaks each language variation within a set of language variations;

generating an inverse distance weighted confidence score for each of the language variations using the confidence score and an inversely weighted distance between the contact and each language variation;

associating a language variation with the contact if that language variation's inverse distance weighted confidence score is above a predetermined value;

determining a skill level with respect to the language variation associated with the contact for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator;

selecting an operator whose skill level in the language variation associated with the contact is above a predetermined value; and

transferring the dialog with the contact to the operator.

22.   A computer-usable medium embodying computer program code for performing operator selection, comprising:

initiating a dialog between a contact and a call handling system;

identifying a language variation spoken by the contact;

determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator;

selecting an operator whose skill level in the language variation is above a predetermined value; and

transferring the dialog with the contact to the operator.

23.   The medium of claim 22, wherein identifying includes:

generating a set of confidence scores indicating a likelihood that the contact speaks each language variation within a set of language variations;

generating an inverse distance weighted confidence score for each of the language variations using the confidence score and an inversely weighted distance between the contact and each language variation; and

associating a language variation with the contact if that language variation's inverse distance weighted confidence score is above a predetermined value.

24.   A system for operator selection comprising a:

means for initiating a dialog between a contact and a call handling system;

means for identifying a language variation spoken by the contact;

means for determining a skill level with respect to the language variation for each operator within a set of operators following the initiation of the dialog between

the contact and the call handling system, the skill level for each operator within the set of operators being determined on a real time basis while each operator is engaged in a dialog with a contact that has been transferred to that operator;

means for selecting an operator whose skill level in the language variation is above a predetermined value; and

means for transferring the dialog with the contact to the operator.

(10)   Evidence Appendix

None.

(11)   Related Proceedings Appendix

None.